R. H. DAY

PACIFIC SEABIRD GROUP

BULLETIN

Vol. 4 Summer 1977 No. 1

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PACIFIC SEABIRD GROUP

The Pacific Seabird Group (PSG) was formed in 1972 out of a need for better communication among Pacific seabird researchers. The Group acts to coordinate and stimulate the field activities of its members and to inform its membership and the general public of conservation issues relating to Pacific seabirds and the marine environment. Current activities include the development of standard techniques and reporting forms for colony censusing, pelagic observations, beached bird surveys, and coastal surveys. Policy statements are issued on conservation issues of critical importance. While the PSG's primary area of interest is the West Coast of North America and adjacent areas of the Pacific, it is hoped that seabird enthusiasts in other parts of the world will join and participate in the PSG. Annual dues for membership in the PSG are $5.00 and are payable to the Treasurer (address on back cover). Members receive the PSG Bulletin.

PACIFIC SEABIRD GROUP BULLETIN

The Pacific Seabird Group Bulletin is issued in the spring or summer, and fall or winter of each year. It contains news of interest to PSG members. Regional reports include a listing of current research and information on seabird conservation. The PSG Bulletin does not act as an outlet for the results of scientific research, but welcomes articles on seabird conservation, seabird research activities, or other topics that relate to the objectives of the PSG. Articles and all other materials should be submitted to the Editor. Back issues of the PSG Bulletin (starting with Spring 1972) are available from the Treasurer for $2.50 each. Some issues are already out of print.

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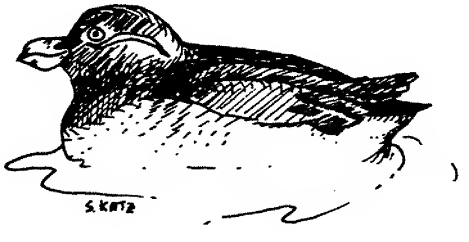

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VOLUME 4 SUMMER 1977 NUMBER 1

THE CHAIRMAN'S PAGE....1

PACIFIC SEABIRD GROUP NEWS....2

Business Proceedings of the Second Annual Meeting....2

Change in Bylaws....3

Items of Interest....3

THE NEXT PSG ANNUAL MEETING....3

PSG EDITOR WANTED....4

PSG WORKING COMMITTEE: COASTAL SURVEYS....4

PSG WORKING COMMITTEE: PUBLICATIONS....4

BULLETIN BOARD....5

Information Wanted....5

Manual for Beached Bird Censusing....5

"Birds of Northwestern California"....5

Translation Available....5

Film on the Short-tailed Albatross Available....5

Exchange of Skeletal Material....6

REGIONAL REPORTS....6

British Columbia....6

Washington....7

Northern California....8

Southern California....10

Mexico....10

Hawaii....11

East Coast, U. S....12

ABSTRACTS OF PAPERS GIVEN: 1976 ANNUAL MEETING....14

Shorebird Symposium, titles only....14

General Papers Session....16

GENERAL NOTES ON SEABIRD CONSERVATION....25

The Seas Must Live: World Wildlife Fund's Marine Programme. David A. Manuwal....25

Oiling of Seabirds from the Argo Merchant Incident. Kevin D. Powers and James M. Loughlin....27

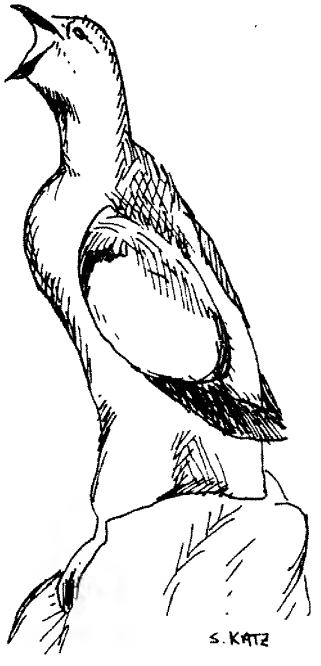
THE CHAIRMAN'S PAGE

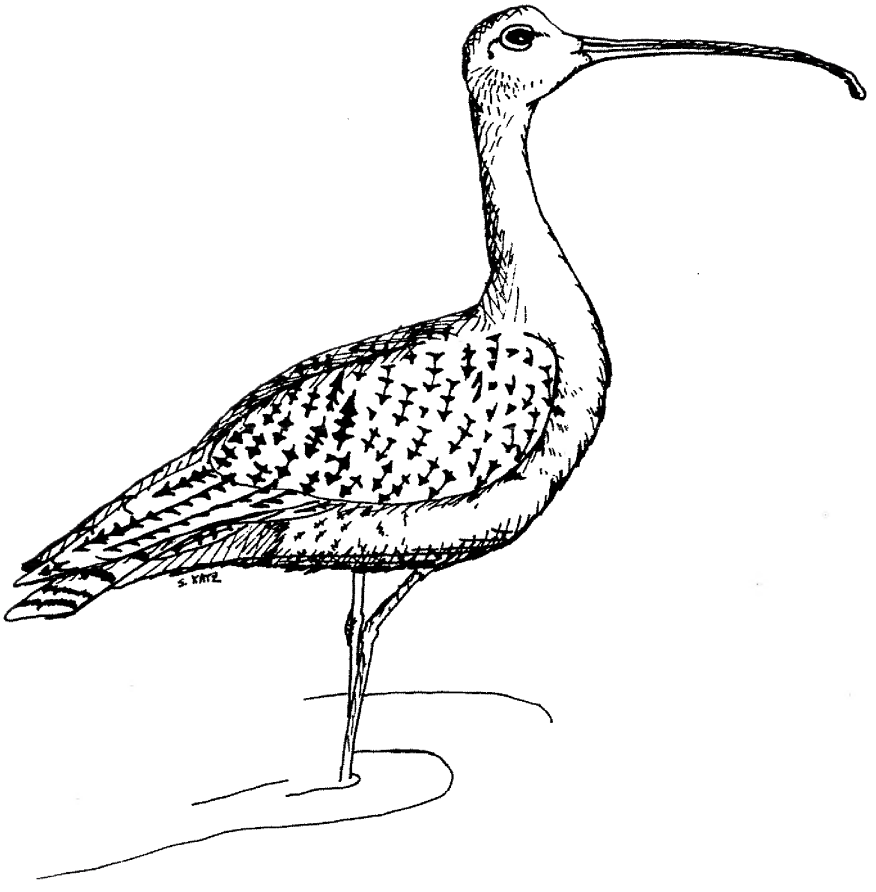
All of us interested in the future of marine bird populations are greatly concerned about the increased amount of human disturbance and oil-related problems. The extensive OCS program, as well as other research efforts on marine birds and their environment, will provide us with much-needed baseline information. Unfortunately, this is not enough. More long-term, integrated studies are needed. The Pacific Seabird Group finds itself in a unique position to provide leadership in planning the future direction of research in North America. Furthermore, we can provide a forum for evaluating past and present data on selected topics. This is one important function of our annual meeting.

The growth of the Pacific Seabird Group in the past year reflects the interests and expectations of marine bird biologists around the world. The inclusion of ornithologists interested in shorebirds and waterfowl is a welcome addition to our organization. We all look forward to reading the results of last year's shorebird symposium.

I hope that all of you plan to attend the next annual meeting of the Pacific Seabird Group in Victoria, British Columbia. This will be the first PSG meeting held outside the United States.

David A. Manuwal
Chairman
July 1977




S. KATZ

I. Business Proceedings of the Second Annual Meeting.

The annual meeting of the PSG executive council was held at Asilomar, Pacific Grove, California on January 6, 1977. The general membership participated in this meeting. The goals, frequency of PSG Bulletins, working committees, establishment of a publication committee, and the subject and location of the fourth annual meeting were discussed.

The goals as stated in the bylaws were reaffirmed; the frequency of the appearance of the PSG Bulletins will remain the same. It was suggested that new committee chairmen will be chosen in 1977 for each of the following 4 working committees: colony censusing, pelagic censusing, beach bird surveys, and conservation. A Conservation Committee is not yet established. The new committee chairmen will write a report on the activities of their committees. The reports should be available to the Executive Council meeting on the morning of January 19, 1978. A new working committee on coastal surveys was established. The function of the Coastal Surveys Committee will be to accumulate techniques of bird surveys in coastal habitats. A Publications Committee was also established to evaluate the feasability of publishing symposia at PSG annual meetings.

It was suggested that a symposium on oil pollution of the Pacific coast of North America should be held at the fourth annual meeting. Two locations were proposed for the meeting: Victoria, British Columbia and Long Beach, California.

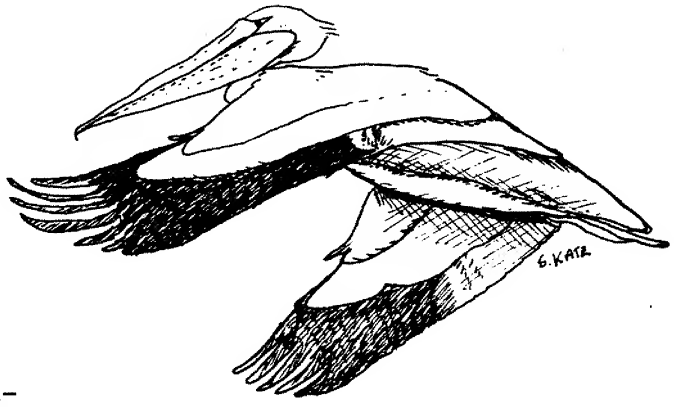
The following members were nominated and elected as officers:

Dave Manuwal - Chairman
Wayne Hoffman - Vice-Chairman
Kees Vermeer - Secretary

It was decided that a person outside the Executive Council should be elected to replace Dave Manuwal as treasurer, and Joan Scott was chosen.

The photo contest has become a growing, annual event; and PSG member, Frank S. Todd, Sea World San Diego, won first place in the photo contest with a photograph of Antarctic penguins. For the record, D. W. Anderson won first place last year with a photograph of brown pelicans. No previous photo contests were held.

Kees Vermeer
Secretary
July 1977



II. Change in Bylaws.

The PSG membership approved the following changes in Articles III and IV of the bylaws, by a vote of 115 to 2. These changes are as follows:

ARTICLE III. ORGANIZATION

Section 1. No change.
Section 2. The Executive Council.
Clause A--Composition. The number of members on the Executive Council will be variable. The Executive Council is composed of all Group Officers and one regional representative from each of the following regions: Alaska, British Columbia, Washington, Oregon, northern California (north of Point Conception), southern California (south of Point Conception), Mexico, and Hawaii. Three other seats on the Council shall be referred to as "non-regional" seats and shall be filled by members not residing in the regions listed above.

ARTICLE IV. OFFICERS

Section 1. Officers.--The Officers of the Group shall be a Chairman, a Vice-Chairman, a Secretary, and a Treasurer. Any member in good standing may be elected to an office. The Executive Council will serve as a nominating committee. The officers will be elected by a majority vote of the membership voting in an election held at least 30 days prior to the annual meeting. Officers will serve for the succeeding year.

David A. Manuwal
Chairman
April 1977

III. Items of Interest.

THE NEXT PSG ANNUAL MEETING--will be held in the main auditorium of the British Columbia Provincial Museum, downtown Victoria, on January 19-21, 1978. The auditorium has a holding capacity of 500 people. The museum has an internal microphone system and has a wide variety of projection equipment. The museum's displays in archaeology, anthropology, mining, forestry and natural history and attractions in the vicinity, in the form of entertainment, shopping, and dining may hold the full attention of wives and children of members, whose main interest is not with PSG.

The local chairman will be Wayne Campbell and the program chairman will be Kees Vermeer.

Victoria may be approached by various routes and methods. For visitors from the U.S.A. and Alaska, the two best approaches, from the economic and time point of view, are by air from Seattle or by boat from Anacortes, Washington. A large number of hotels are available to visitors within

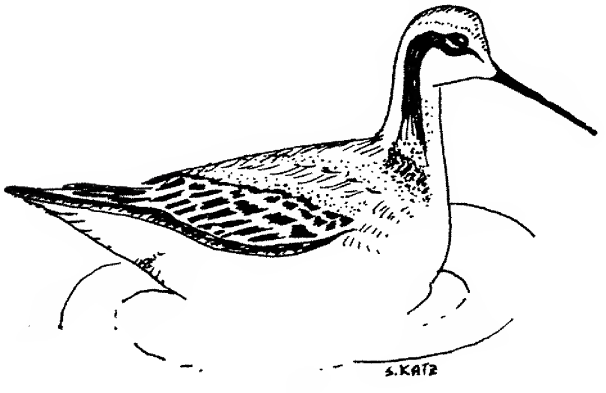
walking distance from the B.C. Provincial Museum. Sea voyages can be arranged from Victoria or Bamfield Biological Station (one afternoon's drive from Victoria). Weather ranges from sunny and mild to rain in January.

The symposium topic presently being considered is: "Oil pollution and marine bird resources of Pacific North America." Meeting announcements with full details and calls for papers will be mailed to PSG members in the Fall.

PSG EDITOR WANTED--PSG is looking for an Editor for the PSG Bulletin, to begin with Volume 5, 1978. In the past, the term of Editor has lasted two years; and, the position involves a commitment to a fair amount of work and personal time. The Editor solicits reports from Regional Representatives and members of the Executive Council twice a year, receives other items from the membership, and judges which items are to be placed in the PSG Bulletin. The Editor sets up the bulletin, gets it printed, and mails it out under a bulk permit issued by a local post office. PSG will consider one-year committments. Anyone interested should contact the present Editor; and, a new Editor will be selected at the next annual PSG meeting in Victoria.

PSG WORKING COMMITTEE: COASTAL SURVEYS--The function of this group will be to accumulate techniques of bird surveys in coastal habitats. These will include foot, plane,and vehicle counts. As envisioned at Asilomar in January 1977, most of this information should be readily accessible, since many coastal investigators are required to submit detailed accounts of methodology to their funding source. A xerox copy should be sent to the committee chairman. Robert Gill, Jr. (Office of Biological Services, USF&WS, 800 A Street, Anchorage, AK 99501) has agreed to chair the committee.

PSG WORKING COMMITTEE: PUBLICATIONS--The Publications Committee will primarily consider whether selected symposia at our annual meetings will be published as "PSG Proceedings." It will also consider the frequency and quality of future PSG Bulletins. The chairman of this committee is D. W. Anderson and members include D. A. Manuwal, F. A. Pitelka, D.Ainley, J.R. Jehl, Jr., G. J. Divoky, and R. W. Schreiber. Presently, the shorebird symposium at the 1976 annual meeting is being considered for publication, as "Proceedings of the Pacific Seabird Group", or "PSG Scientific Reports", Number 1(1976). "Annual Proceedings" at this point do not seem feasable because of the difficulties in financing such proceedings on an annual basis and other problems. The committee will formally meet in late-August, and a report for the next PSG Bulletin will be forthcoming.



INFORMATION WANTED--Please send any information on the location of inland gull colonies in Washington, Idaho, and Oregon. If known, please include information on the approximate year the colony started, the number of breeding pairs, and the ratio of California to Ring-billed Gulls.

Michael R. Conover
Department of Zoology
Washington State University
Pullman, Wash. 99163

MANUAL FOR BEACHED BIRD CENSUSING--The U.S. Fish and Wildlife Service has contracted the Pt. Reyes Bird Observatory to produce a publication entitled "A Manual for Censusing Beached Birds and Mammals on the West Coast of North America." Project Officer is J. F. Watson (U.S.F.W.S., 1500 NE Irving St., POB 3737, Portland, OR 97208) and Contractor is D. G. Ainley (P.R.B.O., 4990 Shoreline HWY., Stinson Beach, CA 94970). Starting-date is 11 April 1977 and finish-date is 31 March 1978. The manual will contain: (1) keys to identify carcasses of birds and mammals from the Bering Sea to Baja California, (2) descriptions of each species' range and additional identification marks, (3) descriptions of methodology for beached animal censuses.

"BIRDS OF NORTHWESTERN CALIFORNIA"--is a volume by C. F. Yocom and S. W. Harris that gives a listing of all birds known from a region of about ten counties in northwestern California. The statuses, habitats, and distributions of about 400 species are given, including shorebirds and seabirds. A hypothetical list of birds not known, but expected, is included, also. The 68 page volume, with maps and photographs, is available through the Humboldt State University Bookstore, Arcata, CA.

TRANSLATION AVAILABLE--With the aid of student translators, the paper by Claus Schönert entitled "Zur Brutbiologie und Ethologie de Zwergseeschwalbe (Sterna albifrons albifrons Pallas)," (The Breeding Biology and Ethology of the Little Tern), which appeared in Schildmacher, H., Beitrage zur Kenntnis Deutscher Vogel, 1961: pp 131-187, has been translated into English. Copies are on deposit in the Van Tyne Library of the Wilson Ornithological Society at the University of Michigan and the reprint files of the Ornithology Departments of the American Museum of Natural History and U.S. National Museum of Natural History. Workers who are particularly interested in the biology and behavior of terns may obtain a Xerox copy, at cost, by writing Dr. Charles T. Collins or Dr. Stuart L. Warter, Department of Biology, California State University, Long Beach, California 90840.

FILM ON THE SHORT-TAILED ALBATROSS AVAILABLE--The reprint copy of the N.H.K. film of Diomedea albatrus in 1973/74 season (of PSG Bull. 3:8-9) is now available for scientific or educational purpose:

> "DIOMEDEA ALBATRUS: King of the seabirds"-Coloured optical 16mm cinefilm in English edition, 30 min. length. Price about $300 (U.S.), extra postage by air mail should be paid by the purchaser. Interested

persons should order specifying the purpose of use by writing to:

Mr. Takahashi, N.H.K. International, N.H.K. Service Center, Kyôdô Building, 41-1, Udagawa-cho, Shibuya-ku, Tokyo 150, Japan.

EXCHANGE OF SKELETAL MATERIAL--J. Van Tets, C.S.I.R.O., POB 84, Lyneham, Canberra, A.C.T. 2602, Australia is interested in exchanging skeletal material of birds, especially cormorants and related birds. The Australasian Seabird Group also exchanges its newsletter with PSG and these are on deposit with the Secretary, PSG.

REGIONAL REPORTS

I. Alaska. No report received.

II. British Columbia.

CURRENT RESEARCH--

(1) Surveys of seabird colonies and birds at sea at the Queen Charlotte Islands will be conducted in May and June, 1977 under supervision of W. Campbell, B.C. Provincial Museum and K. Vermeer, Canadian Wildlife Service, respectively.

(2) Studies intended to be conducted on British Columbia seabirds this summer will be:

a. Survey of seabird populations on Hippa Island, Queen Charlotte Islands by Steven Purcells.

b. Crow predation on Pelagic Cormorants on Mitlenatch Island by Robert Butler.

c. Study of Black Oystercatchers on Cleland Island by Sarah Groves.

d. Study of Cassin's Auklets, Rhinoceros Auklets, and Tufted Puffins on Triangle Island by Kees Vermeer.

ITEMS OF INTEREST--

(1) Four agencies in British Columbia (Canadian Wildlife Service, Environmental Protection Service, British Columbia Fish & Wildlife Branch, and British Columbia Provincial Museum) are planning a cooperative program for the compilation of a Seabird Atlas of British Columbia. The atlas will show the present knowledge on numbers and distribution of birds at sea along the British Columbia coast.

(2) A book of British Columbia seabirds is expected to be published in the summer of 1978. The compilers are R. W. Campbell, R. H. Drent, and C. J. Guiguet.

(3) A northern B.C. coastal wildlife resources map has been prepared by the British Columbia provincial Fish and Wildlife Branch in January 1977. The map shows seabird colonies, water bird aggregations and sealion colonies in northern British Columbia. Together with a wall map of "Seabird colonies of the Vancouver Island area" issued by the British Columbia provincial museum, information on seabird colonies on the British Columbia coast has been well-documented.

(4) A vulnerability index for ports and approaches to British Columbia ports with respect to migratory birds is presently being compiled under direction of L. Retfalvi, Canadian Wildlife Service.

Kees Vermeer

III. Washington.

CURRENT RESEARCH--University of Washington (Wildlife Science Group, College of Forest Resources) and John Graham and Co.

A joint study is being conducted of the utilization of dredged material islands by birds in Washington and Oregon. Primary emphasis is breeding colonial water birds but use by migrants is also being studied. The study is funded by the U.S. Army Corps of Engineers, Waterway Experiment Station, Vicksburg, Mississippi.

To my knowledge no new research is being conducted on seabirds other than those listed in PSG Bulletin Vol. 3(2).

ITEMS OF INTEREST--Alaska Oil Transportation and Refining in Puget Sound.

The exact location of an oil terminal for Alaskan crude oil refining in Washington has been a very controversial topic for months. Many sites were proposed, some of them absurd; however, it now appears that either Cherry Point or an area west of Port Angeles will be the chosen location. As of this writing, the Washington State Legislature has passed a bill limiting development of any oil superport to or west of Port Angeles on the Olympic Peninsula. A senate amendment to the bill stipulates that a pipeline from such a facility must be built within the United States. A rival Cherry Point proposal includes use of an existing pipeline reaching the Midwest by way of Canada. This last provision probably killed the Cherry Point proposal in the legislature becuase eastern Washington would greatly benefit from a pipeline running through this state rather than through Canada. Nearly all Eastern Washington legislators voted for the Port Angeles bill. They envision a sprouting petrochemical andfertilizer industry and lower gas and oil prices because of the cross-state pipeline. Governor Dixy Lee Ray has threatened a veto of the Port Angeles bill.

Arguments for and against the Port Angeles bill generally follow the traditional economic lines. However, the over-all risk to seabird populations appears lower than the corresponding Cherry Point proposal. There are apparently relatively few marine birds utilizing the middle of the Strait of Juan de Fuca except possibly as a pathway to and from the San Juan and Gulf Islands. So tanker traffic to Port Angeles will most likely have less effect than traffic through the San Juan Islands to Cherry Point. There are approximately 17,000 pairs of breeding marine birds (mostly gulls) in the San Juan Island area.

Unfortunately the Port Angeles proposal will result in higher construction costs since a new pipeline must be built around the south end of Puget Sound. Construction of the new pipeline will undoubtedly result in some loss of terrestrial wildlife habitats. The superport and the associated development will without question have a detrimental effect on the Olympic Peninsula.

New Regional Representative for Washington.

Lora L. Leschner has been appointed as Washington Regional Representative while David A. Manuwal serves as Chairman of PSG. Her address is the same as Manuwal's.

David A. Manuwal

IV. Oregon. No report received.

V. Northern California.

Beside projects listed in the PSG Bulletin, Vol. 3 (No. 1), most of which have been continuing, the following have recently been initiated:

(1) Beached bird censuses:

a. Stan Harris and students, California State University, Humboldt, have been determining how census frequency affects the number of carcasses found.

b. Point Reyes Bird Observatory is preparing a manual for conducting beached bird censuses, mainly comprised of a key to maggoty marine bird and mammal carcasses--North American Pacific and Bering Sea Coast species. The project is being funded by the U.S. Fish and Wildlife Service. When a preliminary manual is completed, by fall 1977, copies will be sent out for review and field testing before a "final" edition is prepared. Might this double for the long awaited report from the PSG Committee on Beached Bird Surveys?

(2) Pelagic censuses.

a. PRBO has initiated monthly cruises to waters well to the west of the Farallones.

b. PRBO is developing a microcomputer system for the shipboard capture, reduction and storage of pelagic census data. A complete report will be forthcoming, probably by the next PSG meeting, complete with pictures of magnetic tape reels to compare with the pictures of punch cards in King et al. (1967. Proc. U.S. Natl. Mus. 123 (3609): 1-29). The project is being funded by NSF and NOAA.

(3) General biology and ecology.

a. A University of California, Berkeley, group, led by Frank Pitelka, has begun analysis of the foraging ecology of Sanderlings in coastal habitats, principally sandy beaches near Bodega Bay. The project is funded by NSF.

b. A PRBO group, led by Gary W. Page, has begun an assessment of coastal Snowy Plover populations. Looking particularly at plover breeding biology, their distribution and the conflicting use of beaches by plovers and humans. The project is funded by California Department of Fish and Game.

c. Jim Blick, University of Michigan, has been studying the relationship between raptor predation and the flocking behavior of wintering shorebirds at Bolinas Lagoon.

(4) Environmental/pollution research.

a. A University of California, Davis, and PRBO group, led by Dick Grau and Dave Ainley, have been conducting experimental studies at the Farallones (lab work at Davis) on the effects of ingested petroleum on the reproductive physiology of Cassin's Auklets and Western Gulls. The project is funded by NOAA.

ITEMS OF INTEREST--

(1) Point Reyes Bird Observatory proudly welcomed George J. Divoky to their staff as a Research Associate. George will be continuing his work on the biology of seabirds in Arctic ice habitats and will also help in the Observatory's studies of Antarctic seabirds.

(2) Tim Osborne recently returned from Africa; the PSG thus no longer has a member in Zambia. Tim has been unofficially looking at some of the seabird breeding colonies he surveyed in 1970 and 1971 for California Fish and Game.

(3) The BLM environmental assessment program for the continental shelf of northern and central California has stalled. The Bureau is apparently waiting to hear from the oil industry about the

latter's interest in oil development of the region. In the meantime, BLM sponsored a workshop, hosted by California State University, San Francisco, in October 1976, to discuss research needed for a proper environmental assessment, and also funded the survey of available environmental information that has preceeded other BLM-OCS projects. PRBO contributed to the review of bird literature, and Vic Morejohn (CSU, San Jose) did likewise for marine mammals. The review will likely be available from BLM sometime in 1977.

David G. Ainley

VI. Southern California.

CURRENT RESEARCH--

(1) Ralph W. Schreiber, in conjunction with Elizabeth Anne Schreiber, Los Angeles County Museum of Natural History, is currently analyzing eight years of data on reproductive success, population dynamics, and nesting chronology on Brown Pelicans in Florida, and three years of similar data on Laughing Gulls. The Schreibers are also studying bird use of dredge islands in Tampa Bay and have started work on specialization problems in noddies (Anous minutus/tenuirostris). They plan studies on the behavior of the Pelecanidae, and Fregatidae, as well as long-term studies of pelagic birds on coral atolls in the Pacific.

(2) In March-April 1977 Frank S. Todd, Corporate Curator of Birds, Sea World, Maurice A. E. Rumboll, Museo Argentino de Ciencias Naturales, Buenos Aires, and Douglas Schwartz, U. C. Irvine, in conjunction with J. R. Jehl, Jr., conducted field studies on the biology and distribution of pelagic birds near South Georgia Island under a grant from the National Science Foundation. Jehl, Todd, and D. W. Anderson are continuing long-term studies of Brown Pelican productivity on Los Coronados.

Joseph R. Jehl, Jr.

VII. Mexico.

ITEMS OF INTEREST--

(1) A second international conference entitled: "II Symposium Binacional del Golfo de California" was held in San Carlos, Sonora on 21-23 April 1977. Working groups (workshops) covered the themes: (1) Natural Resources, (2) Agriculture and Livestock, (3) Tourism, (4) Human Settlements, and (5) Industry. Twenty-six scientists from Mexico and the U.S. participated in the working group on Natural Resources. The marine bird resources in the Gulf of California were discussed, but the diverse and general

topics prevented much detail. Proceedings will be published in a 1978 issue of Natural Resources Journal. A third symposium in 1978 will be held in La Paz, Baja California.

(2) Nominations for Mexican Regional Representative are open for 1978. Please send names to David A. Manuwal, Chairman PSG.

(3) Recent publications of interest:

Anderson, D. W., J. E. Mendoza, and J. O. Keith. 1976. Seabirds in the Gulf of California: a vulnerable, international resource. Nat. Res. J. 16(3):483-505.

Villa-Ramirez, B. 1976. Isla Rasa, Baja California, Enigma y Paradigma. Supervivencia 2(7):17-29.

Daniel W. Anderson
(interim reporter)

VIII. Hawaii.

CURRENT RESEARCH--

(1) There is no additional seabird research to report in this issue of the PSG Bulletin, although the thermoregulation paper on Sooty Terns, reported in the last Bulletin (Vol. 3, No. 2) is now available:

MacMillen, R. E., G. C. Whittow, E. A. Christopher, and R. J. Ebisu. 1977. Oxygen Consumption, Evaporative Water Loss, and Body Temperature in the Sooty Tern. Auk, 94(1):72-79.

In addition, several short papers on Sooty Terns and Noddies, based on research in Hawaii, have been published by William Y. Brown in Auk and Condor over the last two years.

(2) G. Causey Whittow, of the University of Hawaii, plans to expand his physiological studies of Hawaiian seabirds with research (Summer, 1977) on the Wedge-tailed Shearwater. Fred Zeillemaker (U.S. Fish and Wildlife Service) has been recording data on Shearwaters and Boobies at his home among the birds at Kilauea Pt., Kauai. He reported several visits by Laysan Albatross to the site this year.

CONSERVATION NEWS

(1) Oahu's Offshore Islets--Proposed regulation changes to create a "State Seabird Sanctuary" of all offshore islets is still held up until strong objections by some local fishermen can be resolved by compromise in wording of the regulation or in the list of islets to be included. This can probably be accomplished with little sacrifice in quality of the regulation.

(2) Hawaiian Islands National Wildlife Refuge--Although aggreements for a tri-party cooperative study of the Northwestern Islands has not yet been signed, it is now in final draft form and should be signed soon. Some studies have begun (monk seal, inshore fisheries) and a research cruise is scheduled for July. On temporary appointment to the U.S. Fish and Wildlife Service, I have been preparing a research plan designed to assess the potential impact of commercial fishing on seabird resources. It is uncertain when and at what level seabird research will be undertaken, but it is a major identified need in the tri-party agreement.

(3) Kaula and Kahoolawe Islands--There is little new to report on the controversy involving return of Kahoolawe to the State of Hawaii. Our legislators have been forewarned that suggesting increased bombing of Kaula as an alternate target will be met with a tremendous outcry of protest among seabird biologists and conservationists. It is one of the most significant Main Island seabird colonies (100,000+ nesting birds of 12 species) and deserves better protection. Frankly, it should be included in the Hawaiian Islands National Wildlife Refuge, but convincing the Navy of this is not likely.

Robert J. Shallenberger

IX. East Coast, U.S.

ITEMS OF INTEREST--

(1) Recently a new non-game waterbird organization, the Colonial Waterbird Group, has been formed on the East Coast. This group seems to be viably segregated from that of the PSG both by geographical area and by realized niche. Herons are numerous on the East Coast. The new group has chosen to concentrate on them and the short-legged waders, gulls, and terns. The deep water seabirds, which are such an important part of the Pacific Seabird Group's constituency, are pretty remote and the alcids are confined to the far northeast and Canada.

(2) A conference on North American Wading Birds was held at Charleston, South Carolina on October 16, 1976. Proceedings are being prepared. The next is scheduled to be held at Northern Illinois University, Dekalb, on October 21-23, 1977.

(3) The new endeavors at censusing herons, gulls, and terns which is being coordinated by the U.S. Fish and Wildlife Service will be continued this year. One unexpected benefit of these and other contracts that roughly fall into the category of Impact Statements has been the realization of the importance of dredge spoil islands as pointed out by Soots and Parnell and the Buckleys. It brings a glow of content to realize that we on the East Coast have the chance of knowing almost as much about the status of our seabirds as is known in Alaska.

(4) A symposium "Fish-eating Birds of the Great Lakes and Environmental Contaminants," sponsored by the Canadian Wildife Service, was held on December 2 and 3, 1976; the Proceedings are available. Along the East Coast, the signs that concentrations of some toxic chemicals are decreasing are encouraging.

Ospreys are building nests in new places and raising full clutches in many parts of Maine. It is too early to hope, but it looks as though Bald Eagles in Maine may be producing some young on their own. Black-crowned Night Herons and Green Herons (unsung victims of hard pesticides) are increasing and extending their ranges. The Yellow-crowned Night Herons and Cattle Egrets which colonized the northeast half a dozen years ago seem to be retreating south. Glossy Ibises and Snowy Egrets seem to be holding on. Least Terns still seem to be increasing and Black Skimmers are extending their range from the south. Oystercatchers and Willets seem to be established on Long Island and show good promise of becoming established on Cape Cod. On the other hand, Roseate Terns in southern New England seem to have suffered a sudden decline in the last few years, and Common Terns in the Cape Cod region seem to be continuing the long term, now catastrophic decline begun in the 1940's when they were displaced from Muskeget and Penikese Islands by Herring Gulls. A major source of contemporary concern is the suggestion of heavy mortality on migration and wintering grounds.

(5) Ian Nisbet gave a report on the status of Herring Gulls on the East Coast to a meeting of the British Trust for Ornithology at Aberdeen in April, 1977... "Preliminary data from censuses started in 1976 suggest that the breeding population of Herring Gulls in the eastern United States was about 95,000 pairs and that in eastern Canada (North to 52^{o}N) was roughly 125,000 pairs. Although some regional populations in Canada (e.g. in southern Newfoundland) may still be increasing, those in most parts of the U.S. appear to be stationary or decreasing. Peak numbers were reported in the St. Lawrence Estuary about 1969, in eastern Newfoundland about 1974, in Massachusetts about 1970 and in Long Island in 1974. Only the southernmost colonies...in Maryland, Virginia, and North Carolina...are now increasing rapidly."

There is still a fortunate opportunity for someone to survey the wintering Herring Gull population, to measure the size of the several age cohorts and to see how the present structure compares with that recorded in 1965 along the East Coast and Gulf of Mexico.

William H. Drury

ABSTRACTS OF PAPERS GIVEN: 1976 ANNUAL MEETING

(Asilomar, Pacific Grove, California--6 to 9 January 1977)

I. Shorebird Symposium: Frank A. Pitelka, Chairman; 6-7 January 1977.

Note: Since the papers presented in this session are currently planned for special publication, only the titles and authors appear below:

(1) Session I, Thurdsay PM, 6 January.

INTRODUCTION: THE PACIFIC COAST SHOREBIRD SCENE. Frank A. Pitelka, Museum of Vertebrate Zoology, University of California, Berkeley.

ASPECTS OF SHOREBIRD OCCURRENCE ON A CENTRAL CALIFORNIA ESTUARY. G. Page, L. Stenzel, and C. M. Wolfe, Point Reyes Bird Observatory, Bolinas, Calif.

LOCAL MOVEMENTS OF WINTER RESIDENT WILLETS AND MARBLED GODWITS ON SOUTH SAN FRANCISCO BAY. P. R. Kelley, California Department of Fish and Game, Eureka, Calif.

FEEDING ECOLOGY OF BLACK OYSTERCATCHERS ON SOUTHEAST FARALLON ISLAND, CALIFORNIA. S. H. Morrel, H. R. Huber, T. J. Lewis, and D. G. Ainley, Point Reyes Bird Observatory, Bolinas, Calif.

MIGRATION OF THE BAIRD SANDPIPER. J. R. Jehl, Jr., Natural History Museum, San Diego, Calif.

SEASONALITY IN A SHOREBIRD FAUNA OF A HIGH ARCTIC ALASKAN LOCALITY. P. G. Connors, J. P. Meyers, and F. A. Pitelka, Museum of Vertebrate Zoology, University of California, Berkeley, Calif.

HABITAT UTILIZATION BY WINTERING AND MIGRATING SHOREBIRDS ON HUMBOLDT BAY, CALIFORNIA. R. H. Gerstenberg, Reedley College, Reedley, Calif.

(2) Session II, Friday AM, 7 January.

THE OCCURRENCE AND ABUNDANCE OF SHOREBIRDS ON A NORTH COASTAL LAGOON OF THE ALASKA PENINSULA. Robert Gill, Jr., U.S. Fish and Wildlife Service, Anchorage, Alaska.

MIGRATORY SHOREBIRD POPULATIONS ON THE COPPER RIVER DELTA EASTERN PRINCE WILLIAM SOUND, ALASKA. M. E. Islieb, Cordova, Alaska.

AN EVALUATION OF THE COPPER RIVER DELTA AS A CRITICAL HABITAT FOR MIGRATING SHOREBIRDS. S. Senner, University of Alaska, Fairbanks, Alaska.

STUDIES OF SEMIPALMATED SANDPIPER MIGRATION ROUTES AND NORTH AMERICAN STOPOVER AREAS IN AUTUMN. B. A. Harrington, Manomet Bird Observatory, Manomet, Mass., and R. I. G. Morrison, Canadian Wildlife Service, Ottawa.

CONSERVATION AND MANAGEMENT OF COASTAL WETLANDS IN CALIFORNIA. J. Speth, California Dept. of Fish and Game, Sacramento.

RESULTS OF THE CALIFORNIA SHOREBIRD SURVEY. R. M. Jurek, California Dept. of Fish and Game, Sacramento.

SHOREBIRD CENSUS STUDIES IN BRITAIN. A. J. Prater, British Trust for Ornithology, Tring, Herts., England.

PREDICTING THE EFFECT OF LOSS OF HABITAT ON OVERWINTERING SHOREBIRDS. J. D. Goss-Custard, Institute of Terrestrial Ecology, Furzebrook Research Station, Wareham, Dorset, England.

SUMMATION AND DISCUSSION, SESSIONS I and II. J. R. Jehl, Jr., Natural History Museum, San Diego, Calif.

(3) Session III, Friday PM, 7 January.

BIOLOGY OF SHOREBIRDS SUMMERING ON ENIWETOK ATTOL. O. W. Johnson, Moorhead State University, Moorhead, Minn.

WINTER ECOLOGY OF A BLACK OYSTERCATCHER POPULATION. B. Hartwick and W. Blaylock, Simon Fraser University, Burnaby, B.C., Canada.

SEASONALITY OF SUMMER HABITAT AND SOCIAL SYSTEM OF RED PHALAROPES. D. Schamel and D. Tracy, University of Alaska, Fairbanks.

FEEDING ECOLOGY OF THREE SPECIES OF CHARADRIUS PLOVERS WINTERING ON THE BAY OF PANAMA, CENTRAL AMERICA. J. G. Strauch, Jr., and L. G. Abele, Museum of Zoology, University of Michigan, Ann Arbor.

FLOCKING BEHAVIOR IN WINTERING DUNLINS. S. Shanewise and S. G. Herman, Evergreen State College, Olympia, Washington.

A BANDING STUDY OF MIGRANT SHOREBIRDS IN NORTHWESTERN COSTA RICA. S. M. Smith and G. Stiles, Universidad de Costa Rica, San Jose, Costa Rica.

TERRITORIALITY IN NON-BREEDING SHOREBIRDS. J. P. Myers and P. G. Connors, Museum of Vertebrate Zoology, University of California, Berkeley.

AVAILABILITY OF INVERTEBRATES AS SHOREBIRD FOOD ON A HUMBOLDT BAY MUDFLAT. L. F. Carrin, N. D. Holmberg, and S. W. Harris, Humboldt State University, Arcata, Calif.

OPTIMAL FORAGING THEORY AND THE FEEDING BEHAVIOR OF REDSHANK. J. D. Goss-Custard, Institute of Terrestrial Ecology, Furzebrook Research Station, Wareham, Dorset, England.

SUMMATION AND DISCUSSION, Session III. J. A. Wiens, Department of Zoology, Oregon State University, Corvallis, Oregon.

(4) Additional Papers.

NOTES ON THE CHARADRIIFORMS OF THE SOUTH COAST OF PERU. R. A. Hughes, Mollendo, Peru.

FEEDING ECOLOGY OF SHOREBIRDS IN THE GENERA CALIDRIS AND LIMNODROMUS ON A CENTRAL CALIFORNIAN ESTUARY. L. Stenzel and G. Page, Point Reyes Bird Observatory, Bolinas, Calif.

SEXUAL DIFFERENCES IN THE FORAGING BEHAVIOR OF LEAST SANDPIPERS. E. H. Miller, Dalhousie University, Halifax, Nova Scotia.

SPACING BEHAVIOR AND LOCAL MOVEMENTS OF SANDERLINGS AT BODEGA BAY, CALIFORNIA. P. G. Connors, Bodega Marine Station, Bodega Bay, Calif.

HABITAT AND SPACING OF WINTERING SHOREBIRDS IN ARGENTINA. J. P. Myers, Museum of Vertebrate Zoology, University of California, Berkeley.

PATTERNS OF HABITAT USE IN A TUNDRA SHOREBIRD COMMUNITY NEAR BARROW, ALASKA. J. P. Myers and F. A. Pitelka, Museum of Vertebrate Zoology, University of California, Berkeley.

(5) Special Presentation, Friday PM, 7 January.

NEEDED: A NATIONAL PLAN FOR RESEARCH AND MANAGEMENT OF COASTAL AND MARINE BIRDS. Harvey Nelson, Associate Director, U.S. Fish and Wildlife Service, Washington, D. C.

II. General Papers Session, Saturday AM-PM, 8 January.

BREEDING BIOLOGY OF FORK-TAILED PETRELS IN THE BARREN ISLAND ALASKA. Dee Boersma, Institute for Environmental Studies, and David A. Manuwal, Dept. of Forestry, University of Washington, Seattle.

The breeding biology of the fork-tailed petrel (Oceanodroma furcata) was studied from May to September 1976 in the Barren Islands, Alaska. Fork-tailed petrels are not sexually dimorphic and both males and females incubate and feed the young. Petrels are present on the Barren Island in May. Young do not fledge until late August or early September. Some young are probably present on the island until October. Descriptive development on 20 known-aged chicks was recorded at weekly intervals. Growth rates were monitored weekly for over 65 chicks. The visitation pattern of adults was determined by burrow checks and night observations. Egg laying and nest visitation was depressed by storms. Nesting success, predation, and general breeding biology were discussed.

FEEDING ECOLOGY OF RING-BILLED AND CALIFORNIA GULLS (LARUS DELAWARENSIS AND L. CALIFORNICUS). Patricia A. Baird, U.S. Fish & Wildlife Service, OBS/CE, Anchorage, Alaska.

California and ring-billed gulls are broadly sympatric on the breeding grounds and are potential competitors for forage areas or for similar food.

Many closely related species avoid competition and coexist by segregation of their feeding niches. Prey selection and foraging habitat selection by the two species was compared to learn what strategies they use to coexist. Their feeding niches are segregated by distance from the colony and by habitat type. Eighty-seven percent of the California Gulls observed fed in prairie or dryland farming areas, while 83% of the ring-billed gulls were observed in irrigated areas, at respective mean distances of 16.4 and 10.8 km from the colony. Their diet overlapped by 62%; California gulls ate a significantly greater amount of large food items, mainly vertebrates, than did ring-billed gulls.

BARCENA VOLCANO, 1952: THE 19th YEAR REPORT ON THE SEA BIRD REPOPULATION. Bayard H. Brattstrom, Dept. of Biology, California State University, Fullerton, California.

The eruption of Volcano Barcena on August 1, 1952, caused considerable damage to the terrestrial and intertidal fauna and flora of San Benedicto Island, Islas Revillagigedo, Mexico. This destruction came about largely through the action of the tremendous amount of pumice, ash, dust, and gas ejected, as well as the extensive seaward flow of lava.

The action of the volcano killed many birds. The seabird fauna was reduced to about one percent of the original bird fauna. The course of the seabird repopulation over the 19 years since the original eruption was described to show that the current population is far beyond the original population. Species differences in rates of repopulation were described and hypotheses for these differences suggested.

SALVAGING SPECIMENS IN THE FIELD. Diana G. Matthiesen, Dept. of Biological Sciences, San Jose State Univ., San Jose, California.

Many PSG members are doing field research in breeding colonies or on wintering grounds where the opportunity to salvage dead birds frequently presents itself. Such opportunities are too frequently passed-up because of the seeming difficulty or near impossibility of preparing and storing the specimens under field conditions. In an effort to encourage the salvage of these valuable specimens, ones that may otherwise be virtually unobtainable to any but the largest museums, methods were given for quickly preparing them with the least amount of time and effort under field conditions. Also discussed were convenient storage and shipping methods, and the hows and whys of "horse-trading" in the bird world. A demonstration of materials and methods followed during the afternoon break.

YOLK FORMATION IN SOME PACIFIC SEABIRDS AND SHOREBIRDS. T. Roudybush and C. R. Grau, Dept. of Avian Sciences, University of California, Davis.

When unincubated eggs are frozen at -20°C, fixed in formalin and stained with potassium dichromate, light and dark rings of yolk become visible around the central yolk (Grau, 1976). A pair of rings, one light and one dark, are deposited during one day of rapid yolk deposition. Eggs collected in Alaska on the Clarence Rhodes National Wildlife Refuge in 1975, and on the Farallone Islands in 1976 were stained and counted. Times of yolk formation varied from 4 to 12 days, as shown in the table:

Time required for the rapid phase of yolk formation and egg size in some Pacific seabirds and shorebirds.

Species	Time for rapid phase of yolk formation (days)		Egg Size (mm)
	# days	# eggs	
Arctic loon, Gavia arctica	8-10?	(1)	74.3 x 45.8
Red-throated loon, Gavia stellata	11-12?	(2)	71.2 x 43.2
Cassin's auklet, Ptychoramphus aleutica	8	(4)	
Pigeon guillemot, Cepphus columba	10	(2)	
Glaucous gull, Larus hyperboreus	12	(2)	72.9 x 53.0
Western gull, Larus occidentalis	10-11	(8)	
Mew Gull, Larus canus	5-8	(6)	60.0 x 42.5
Sabine's gull, Xema sabini	7-8	(4)	34.8 x 28.8
Arctic tern, Sterna paradisaea	6	(2)	38.6 x 29.6
Red phalarope, Phalaropus fulicarius	4-5	(5)	31.4 x 22.2
Northern phalarope, Lobipes lobatus	6-7	(7)	28.4 x 20.2
Western sandpiper, Ereunetes mauri	5-8	(9)	32.1 x 22.0
Bar-tailed godwit, Limosa lapponia	8-12	(8)	56.1 x 39.0
Ruddy turnstone, Arenaria interpres	5-6	(4)	40.6 x 30.2

ENERGETICS OF DEVELOPMENT IN THE COMMON TERN, SOOTY TERN, AND LEACH'S PETREL. Robert E. Ricklefs, Department of Biology, University of Pennsylvania, Philadelphia.

Energy requirements for growth and maintenance were determined for chicks of the common tern (Sterna hirundo) on Great Gull Island, New York, the sooty tern (S. fuscata) on the Dry Tortugas, Florida, and Leach's petrel (Oceanodroma leucorhoa) on Kent Island, New Brunswick. Oxygen consumption was measured in a closed system with an oxygen electrode (Beckman Field Lab). Accumulation of energy in tissues was estimated from accumulation of lipid and non-lipid ash-free material in a series of specimens of each species. Energy requirements plotted as a function of age reveal striking differences in energy utilization and allocation in the three species. These patterns are discussed with respect to the prolonged development of the sooty tern and Leach's petrel and the accumulation of large lipid stores in Leach's petrel chicks. I suggest that a function of lipid accumulation in the petrel is as an energy sink, helping to balance the chick's protein/calorie intake. The starvation period of procellariids is seen as a mechanism for dumping this accumulated energy before fledging. Slow growth in the sooty tern may be an adaptation to reduce the energy requirement of the chick or to enable the chick, which has a low maintenance metabolism requirement, to accumulate required mineral nutrients, such as sulfur, from its diet.

GROWTH RATES AND FOOD HABITS OF RHINOCEROS AUKLETS ON DESTRUCTION ISLAND, WASHINGTON. Lora Lynn Leschner, Wildlife Group, College of Forest Resources, University of Washington, Seattle.

The breeding biology of the rhinoceros auklet (Cerorhinca monocerata) was studied on Destruction Island, Jefferson County, Washington, during the summers of 1974 and 1975. This paper deals with growth rate data collected during this study. Daily measurements were taken and growth curves were converted to straight lines by Ricklefs' (1967) graphical curve-fitting method.

Chicks in 1974 grew 17 percent more slowly than chicks in 1975. Chicks in 1974 reached 64.3% of adult weight versus 67.7% in 1975. The asymptote weight and fledging weight were significantly lower in 1974 ($P<0.05$). The slower growth rate and lower fledging weight may be related to differences in feeding conditions between years.

A COMPARISON OF THREE SPECIES OF PUFFINS ON CHOWIET ISLAND, ALASKA. Galen C. Burrell and Lora Lynn Leschner, U.S. Fish and Wildlife Service, Anchorage, Alaska.

Approximately 54,000 pairs of horned puffins (Fratercula corniculata), 2,000 pairs of tufted puffins (Lunda cirrhata), and 386 pairs of rhinoceros auklets (Cerorhinca monocerata) nest on Chowiet Island, Semidi Islands National Wildlife Refuge, Alaska.

Although there was considerable overlap in nest-site selection between tufted and horned puffins, there were some differences in frequency of occurence in different habitats. Tufted puffins often nested in burrows or depressions under single large boulders, while horned puffins nested primarily in crevices in cliffs or boulder piles. Rhinoceros auklets, on the other hand, nested exclusively in burrows.

Eggs were laid by tufted puffins between 25 May and 30 June and by rhinoceros auklets between 20 May and 17 June, but horned puffins did not lay eggs until 14 June to 9 July. Nesting success was lower in tufted and horned puffins than in rhinoceros auklets. Of 16 tufted puffin chicks hatched, 56% were believed to have successfully left the island, while 59% of 32 horned puffin chicks and 72% of 32 rhinoceros auklet chicks were believed to have left.

Nestling growth rates were analyzed by Ricklefs (1967) graphical curve-fitting method. This method is based on the conversion of growth curves to straight lines by factors derived from growth equations. The Gompertz equation fit the growth data of all three species and the constant "k" (overall growth rate) was calculated from the slopes of the lines.

The possible relationship between the feeding ecology of the three species and the differences in growth rate and nesting success was discussed.

SEASONAL CEPHALOPOD PREDATORY HABITS OF THE PACIFIC FULMAR. Janice L. Cross and G. Victor Morejohn, Moss Landing Marine Laboratories, Moss Landing, California.

During the months of February, March, April, and May of 1976 a mass die-off of Pacific fulmars (Fulmarus glacialis) took place in Monterey Bay and north and south along coastal California. Two hundred and forty-seven birds were gathered; one hundred and seventy-two contained food. Thus far, this represents the largest sample of fulmar stomachs studied in the North Pacific. Cephalopods were found in all 172 stomachs and consisted of 7 species. Nereid worms, fish, and crustaceans also occurred in some stomachs.

Four of the most abundant squid taxa from these stomachs were compared as to relative abundance at two week intervals throughout the collection period. Marked shifts took place in relative abundance of these species. Interpretations of these fluctuations was discussed in relation to fulmar feeding behavior, oceanographic conditions, and availability of cephalpod species.

POPULATION AND BREEDING ECOLOGY OF NESTING SEABIRDS AT KONGKOK BAY, ST. LAWRENCE ISLAND, ALASKA. Gary F. Searing, LGL Limited, Environmental Research Associates, Edmonton, Alberta, Canada.

The phenology, abundance, and breeding success of 12 species of seabirds that nest at Kongkok Bay, St. Lawrence Island, Alaska, were documented during 1976. The 1976 breeding season was about 1 to 2 weeks later than average for most of the species that were studied. The delay in the arrival and nesting activities of most of the cliff-nesting birds at Kongkok Bay was thought to be due to the prolonged snow cover on the ledges and talus slope areas.

The numbers of auklets in Kongkok Basin increased 59% from 1966 to 1976. Most of this increase was the result of a 95% increase in the numbers of least auklets (Aethia pusilla) whereas crested auklets (A. cristatella) increased by only 18%. The numbers of common and thick-billed murres (Uria aalge and U. lomvia) and black-legged kittiwakes (Rissa tridactyla) that nested at Kongkok Bay during 1976 were substantially lower than the numbers that nested there during 1972. Murres showed a four-fold decrease in numbers from approximately 60,000 in 1972 to about 15,000 in 1976. The number of kittiwakes that were observed during 1976 was only 12.5% of the number that was present at Kongkok Bay during 1972. Rather than being caused by an actual population decline, the lower numbers of murres and kittiwakes on the nesting ledges may have been caused by birds that failed to breed due to the late season. The numbers of seven other species that nested at Kongkok Bay were also estimated.

Least auklets had an estimated hatching success of 48.6% whereas crested auklets hatched only 30.6% of their eggs. The growth rates of least and crested auklet chicks were not significantly different from each other; least auklets gained up to 3.73 gm/day (4.1% of adult weight) and crested auklets gained up to 8.87 gms/day (3.3% of adult weight). The breeding success of murres (from egg to fledged chick) was 60.6%. Of 50 black-legged kittiwake nests that were checked, only two nests contained

eggs. The nesting failure of kittiwakes was apparently widespread throughout the Bering and Chukchi Seas during 1976.

This study was sponsored by the NOAA-OCSEAP program.

SEABIRDS--ALASKA TO HAWAII. Patrick J. Gould, U.S. Fish and Wildlife Service, Anchorage, Alaska; Wayne Hoffman, Oregon State University, Corvallis; and Terry Wahl, Bellingham, Washington.

This report summarizes seabird observations along 158 W longitude from the Alaskan Peninsula to Oahu. Research was conducted on board the F/V Moana Wave from October 23 to November 7, 1976. Funding was provided under the U.S. Fish and Wildlife Office of Biological Services research unit 337 and the Oregon State University research unit 108, both Outer Continental Shelf projects funded by BLM and managed by NOAA. Seabird density and distribution were determined by standardized transects and general observations. Surface water temperature and salinity data were collected concurrent with seabird observations.

Seabird density was ca. 45 birds/Km^2 over the Alaska shelf at 54.7 N, dropped to a level of 6-10 birds/Km^2 from 52 N to 41 N, and then dropped to a level of 0.4-1.5 birds/Km^2 from 39 N to 23 N. Distribution patterns tended to divide into: 1) species occurring throughout the area, 2) arctic species dispersing south to about the subarctic convergence, and 3) tropical species beginning at about the subarctic convergence and continuing southward. Significant new information on distribution was obtained for many species including: 1) Kermadee and Herald Petrel's from ca. 41 N southward, 2) Phoenix Island Petrel north to 24 N, and 3) Red-tailed tropicbird north to 36 N.

BREEDING SEABIRD DISTRIBUTION AND ABUNDANCE ALONG THE SOUTH SIDE OF THE KENAI PENINSULA, ALASKA. Edgar Bailey, U.S. Fish and Wildlife Service, Office of Biological Services, Anchorage, Alaska.

Between 19 June and 14 July 1976, an inventory of the marine birds and mammals along the south side of the Kenai Peninsula between Cook Inlet and Seward was conducted by the National Park Service and the Fish and Wildlife Service. The main purpose of determining seabird species composition, distribution, and abundance along this 600 miles of coastline was to support creation of the proposed Harding-Ice Field--Kenai Fjords National Monument, or an alternative proposal--the Aialik National Wildlife Refuge.

A total of 174,000 seabirds, excluding shearwaters and storm petrels, and representing 30 species, was recorded along the Kenai Coast. Of the estimated 53,000 breeding pairs, tufted puffins (Lunda cirrhata) comprised over half of the total., Black-legged kittiwakes (Rissa tridactyla), common murres (Uria aalge), horned puffins (Fratercula corniculata), and glaucous-winged gulls (Larus glaucescens) were the next most common species nesting. Though previously not known as breeders in this area, for -tailed storm petrels (Oceanodroma furcata)were found nesting on seven islands. Rhinoceros auklets (Cerorhinca monocerata) discovered in the Chiswell Islands constitute the northernmost colony known in North America. A colony of northern fulmars (Fulmaris glacialis) and a Kittlitz's murrelet (Brachyramphus brevirostre) nest were also found. Seabird

abundance varied markedly along the Kenai Peninsula with greatest concentrations occurring at the Chiswell Islands, followed by the Pye Islands and the Cape Ressurrection area.

FEMALE-FEMALE PAIRING IN WESTERN GULLS--AN UPDATE. Molly Warner Hunt and George L. Hunt, Jr., Department of Ecology and Evolutionary Biology, University of California, Irvine.

Data collected in 1976 confirm and enlarge upon information of female-female pairs of western gulls (Larus occidentalis wymani) reported to the Pacific Seabird Group in 1975. These birds, which nest on Santa Barbara Island, California, share a territory that has no resident male. Both females contribute usually infertile eggs to a supernormal clutch laid in one nest. These supernormal clutches comprise approximately 11% of all nests in the colony.

In the 1976 season most female-female pairs that were sexed and banded in 1975 were found together again on the same territories. In three of seven pairs under observation in 1976, one female in each pair was seen mounting the other and performing copulatory movements typical of a male. In agonistic interactions female-female pairs used the same repetoire of behaviors as male-female pairs. Aggressiveness in both sexes and in both type of pairs varied greatly between individuals.

DISTRIBUTION OF PUFFINUS GRISEUS AND P. TENUIROSTRIS IN THE GULF OF ALASKA AND BERING SEA. Juan Guzman and M. T. Myers, Dept. of Biology, University of Calgary, Calgary, Alberta.

The distribution of sooty sherawaters (Puffinus griseus) and short-tailed shearwaters (P. tenuirostris) was studied during the summers of 1975 and 1976, from the Research Vessels DISCOVERER and SURVEYOR of the National Oceanographic and Atmospheric Administration. Cruises covered the North-eastern and North-western sectors of the Gulf of Alaska and Bristol Bay in the Bering Sea, also transects were made between Seattle and Kodiak across the Central Gulf on three occasions.

Shearwaters congregate mainly over the Continental Shelf and regions of relatively permanent high densities of shearwaters apparently exist. These are thought to occur in zones of productivity from which the birds move away only during adverse conditions.

A LOOK AT THE CURRENT BREEDING DISTRIBUTION AND ABUNDANCE OF THE ALEUTIAN TERN IN NORTH AMERICA. Robert Gill, Jr. and Matthew Dick, U.S. Fish and Wildlife Service.

The Aleutian tern (Sterna aleutica) has been the least studied of all North American Sterninae. This presentation summarizes the most recent data on its breeding distribution and abundance in North America. Data were gathered during the 1975-1976 breeding seasons. Major contributors included: (1) over 20 USF&WS operated and BLM funded Outer Continental Shelf field studies throughout coastal Alaska, (2) 35 similarly operated and funded shipboard cruises over the Alaska outer continental shelf, and (3) independent researches associated with the University of Alaska.

Current breeding distribution and populations were discussed. Variations in habitat requirements and nesting chronology throughout the breeding range are presented.

AN OIL VULNERABILITY INDEX FOR MARINE ORIENTED BIRDS. James G. King, U.S. Fish & Wildlife Service, Juneau, Alaska, and Gerald H. Sanger, U.S. Fish & Wildlife Service, Anchorage, Alaska.

The 176 full-species of birds using marine habitats of the Northeast Pacific are graded on 20 separate factors that affect their survival. A point score of 1, 3, 5 representing a low, medium or high significance is assigned to each factor. The total point score is the oil vulnerability index (OVI). The OVI range is 1 to 100 with high score indicating greatest vulnerability. In this way the avifauna of different areas can be described numerically as an aid in the management decision making process.

SYNERGISTIC EFFECTS OF DDE AND FOOD STRESS ON REPRODUCTION IN BROWN PELICANS AND RING DOVES. James O. Keith, Christine A. Mitchell, Kirke A. King, Patuxent Wildlife Research Center, U.S. Fish and Wildlife Service.

Data from eight years of research on brown pelicans (Pelecanus occidentalis) is examined to illustrate how these seabirds have adapted to handle periods of food scarcity during reproduction. Their strategy is to reproduce only when excess energy is available, and to cease all efforts when energy demands compromise their ability to maintain body condition.

Our studies indicate that food problems were more intense and had greater effects than could be expected in a healthy population. Brown pelicans had an excessively low, average rate of productivity over the eight-year period. It appears food shortages and pollution both contributed to their inadequate productivity in some instances. Commercial fishing has greatly increased and may limit the food available to pelicans. Also, most pelicans carry some body burdens of DDE and other chemicals.

Subsequent experimental studies with ring doves (Streptopelia risoria), a species with a strategy for reproduction similar to that of many seabirds, have shown that DDE has devastating effects on reproductive performance of birds subjected to food restriction. Body residues of DDE in doves more than doubled the effects of food restriction in courtship behavior, egg laying, nest desertion and ultimate, overall productivity.

Findings have implications to seabirds, in general, and to other species that depend on variable food supplies. Such animals appear uniquely susceptible to man-made changes and pollution in their environments.

ORGANOCHLORINE RESIDUES IN ALASKAN SEABIRD EGGS. Harry M. Ohlendorf, James C. Bartonek, Erwin E. Klaas, U.S. Fish and Wildlife Service, and George Divoky, Alaska Department of Fish and Game.

Eggs were collected at ten localities in the Gulf of Alaska, Aleutian Islands, Bristol Bay, and Pribilof Islands. The presence of mirex,

toxaphene, hexachlorobenzene, and various chlordane compounds, as well as other organochlorines, in these eggs was confirmed by a combined gas chromatograph-mass spectrometer.

The frequency of occurrence and mean residue levels of various organochlorines varied by species and locality. Glaucous-winged gulls (Larus glaucescens) generally had the highest levels of organochlorines wherever their eggs were collected. Mean levels of DDE (5.2 ppm, wet weight) and PCBs (3.5 ppm) in gull eggs from Bogoslof Island were higher than in any other species from any other locality. Mean DDE residues (1.4 ppm) in ancient murrelet (Synthliboramphus antiquum) eggs from Buldir Island were significantly higher than in eggs of most other species from that locality. There were also significant differences among other mean organochlorine residues, but the levels were lower. Hexachlorobenzene residue levels sometimes exceeded those of DDE or PCBs, which is uncommon in field-collected samples.

ASPECTS OF THE REPRODUCTIVE BIOLOGY OF RED-LEGGED KITTIWAKES (RISSA BREVIROSTRIS AND R. TRIDACTYLA) ON THE PRIBILOF ISLANDS. George L. Hunt, Jr. and Molly Warner Hunt, Dept. of Ecology and Evol. Biology, University of California, Irvine.

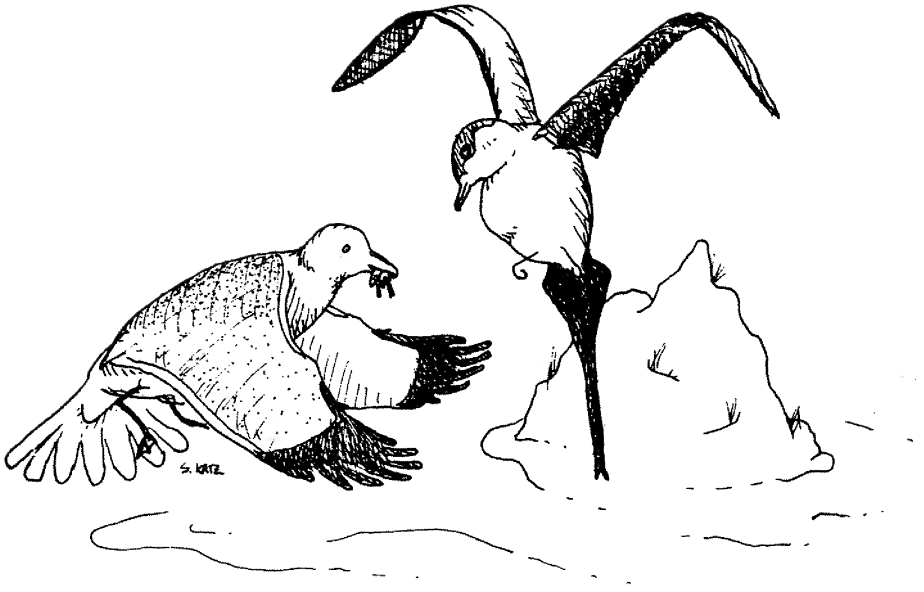
We report the results of the first two years of kittiwake data from an on-going study of Pribilof Island seabirds. Population size of the two species differs greatly between the two islands, with red-legs relatively rare on St. Paul, and abundant on St. George. Phenology of the two species was similar in 1975 and 1976 on St. Paul. On St. George, in 1976, black-legged kittiwakes nested about a week earlier than red-legs. Red-legged kittiwakes nested on shorter, shallower ledges than black-legs.

Black-legged kittiwakes laid one to two eggs with a mean of 1.44. Hatching success was 54 to 67 percent on St. Paul and 67 to 80 percent on St. George. Fledging success was 57 to 70 percent on St. Paul and 75 to 85 percent on St. George. Red-legged kittiwakes lay only one egg. Hatching success was 56 percent (1975) and 83 percent on St. Paul(1976), and 82 percent on St. George. Fledging success was 80 to 94 percent on both islands.

Causes of chick mortality were discussed and the data from the Pribilof Islands were compared with published accounts of kittiwake reproductive ecology. The comparison of black-legged and red-legged kittiwakes as r- and K-selected species was discussed.

A CENSUS OF PRIBILOF SEABIRDS: SOME ASPECTS OF DAILY LEDGE ATTENDANCE. Lance Craighead and Joseph J. Hickey, Dept. of Wildlife Ecology, University of Wisconsin, Madison.

A census of the ledge- and crevice-nesting seabirds of the Pribilof Islands was undertaken in the summers of 1975 and 1976. The numbers of six ledge-nesters were estimated using a stratified sampling technique on cliff photographs. These sample counts were adjusted using correction factors for variations in daily ledge attendance. Some congruences between synchronization of ledge attendance behavior and breeding phenology were noted. The numbers of crevice-nesters on cliffs were estimated from the numbers of ledge-nesters by using species proportion figures obtained from 63 reference ledges. Least auklets (Aethia pusilla) in a large inland colony were estimated by using quadrat counts and flight counts.


S. KATZ

GENERAL NOTES ON SEABIRD CONSERVATION

THE SEAS MUST LIVE: WORLD WILDLIFE FUND'S MARINE PROGRAMME

by

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The World Wildlife Fund and IUCN have initiated the first phase of a $10 million program for a global marine conservation strategy. The details of this program are presented in the IUCN Bulletin, New Series 7, No. 12, December 1976 and are briefly summarized below. The objective of the WWF/IUCN effort is to safeguard the most vulnerable animals, conserving the most precious habitats, stimulating governments and international organizations to act on a wider scale, and generating public support for such action.

The specific aim of the global marine conservation strategy is the conservation of major marine processes by: (1) protecting habitats critical for such processes, and (2) maintaining the linkages between those habitats and the rest of the processes of which they are parts. IUCN has four contracts with the United Nations Environment Program to achieve part of this aim. It has undertaken two appraisals of the Mediterranean Sea (one of potential marine parks and reserves; the other of coastal wetlands); surveyed parts of the Red Sea, Persian Gulf, and Northern Indian Ocean; and surveyed parts of the South Pacific.

The WWF/IUCN programme is divided into three phases: (1) launch phase (January-June 1977), (2) main phase (July 1977-December 1978), and (3) follow-up phase (January 1979→). The launch phase consists of three subprograms, each directed toward one of the three main groups of threats to the life of the seas: (1) conservation of critical habitats, (2) regulation of use, and (3) regulation of competing and other destructive activities. These subprograms consist of several action plans: for the conservation of cetaceans, seals and otters, sirenians, sea and coastal birds, turtles, molluscs and corals, seagrasses and mangroves; for the establishment of international agreements; and for the development of new methods of management.

The $10 million (US) program is allocated according to the following budget:

Cetaceans	$2.0
Seals and otters	1.0
Sirenians	0.5
Birds	1.0
Crocodiles	0.4
Turtles	1.0
Molluscs, corals, seagrasses, mangrove	3.0
International agreements, development of new methods of management	0.5
Program development	0.6

Among the various projects, the following are of particular interest to PSG members:

(1) coastal waders (Europe and Northwest Africa),
(2) Wadden Sea (Netherlands, Federal Republic of Germany and Denmark),
(3) coastal wetlands in industrial areas,
(4) Directory of Western Palearctic Wetlands,
(5) Audouin's gull (Mediterranean),
(6) Filfla (Malta)-(storm petrels, Cory's shearwater colonies),
(7) conservation of the Finnish archipelago, and
(8) conservation of seabirds (Gilbert Islands).

All of us are alarmed at the present over-fishing and pollution of the oceans. The broad program of the WWF/IUCN deserves the support of the PSG membership. Those of you who want more information on The Seas Must Live program should contact Vivian Silverstein, Press and Public Affairs Officer, World Wildlife Fund, 1319-18th St. NW, Washington, D. C., 20036.

OILING OF SEABIRDS FROM THE ARGO MERCHANT INCIDENT

by

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On 15 December 1976, the Liberian tanker ARGO MERCHANT carrying 7.6 million gallons of industrial oil went aground on Fishing Rip on Nantucket Shoals, approximately 30 miles southeast of Nantucket Island, Massachusetts. Within 5 days, 100,000 gallons of oil had seeped from the vessel and drifted to the north and east. On 21 December 1976, the tanker broke apart releasing the remainder of its cargo to the surrounding waters. An oil slick 27 miles wide had extended 100 miles to the northeast by 23 December and was beginning to break up into large "pancakes", several hundred feet in diameter. The prevailing winds became northwesterly and blew the slick to the southeast off the continental shelf.

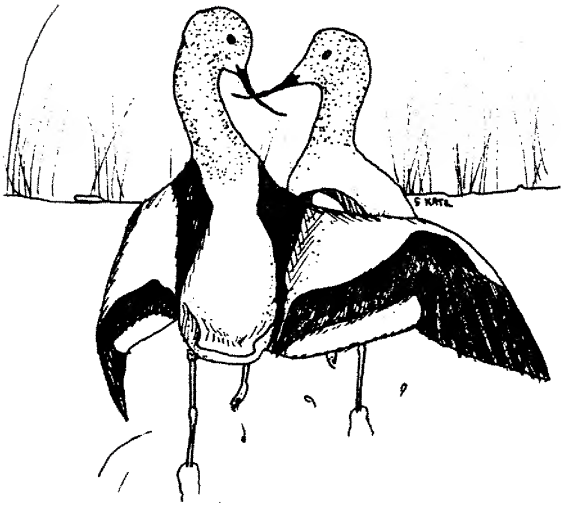
At the site of the grounded tanker, 30 to 260 birds were sighted daily from 15 to 24 December. Approximately 80 percent of the birds were gulls (i.e. great black-backed (Larus marinus) and herring gulls (L. argentatus) and black-legged kittiwakes (Rissa tridactyla)). Few alcids were seen, but seas were very rough. Visibly oiled birds were not observed until almost 48 hours after the tanker went aground. By 24 December, 70 to 100 percent of the great black-backed and herring gulls were oiled on the head and abdomen. Gannets (Morus bassanus) and kittiwakes appeared to be proportionately less contaminated. Only one alcid was seen visibly oiled, but observation conditions were poor.

Beached bird censuses on Nantucket Island resulted in 131 birds being taken between 20 December 1976 and 01 January 1977. The greatest number of birds taken on any one day was 21 on 24 December. A total of 53 live and 78 dead birds of 14 species were handled. Fifty-two of the live birds and 63 of the dead birds were visibly oiled. The predominant families of oiled birds washed ashore were alcids (42 percent), gulls (24 percent), and loons (16 percent). Seabird watches made from fixed points on Nantucket Island indicated gulls were the species most affected by the spill. Approximately 25 percent oiled gulls to total gulls were observed. Gulls were generally oiled on the breast and abdomen; loons were oiled only on the sides and back; and many alcids were heavily oiled on the abdomen, sides, and lower back. Information concerning Nantucket Island observations was provided by Massachusetts Division of Fisheries and Wildlife.

From 5 to 9 January 1977, bird observations at sea were made outside, along the northern and eastern boundaries, and within the oil slick track area. Results indicated greater numbers of birds on the periphery and outside the affected area than within the oil slick track, but greater proportions of visibly oiled birds to total birds were observed within the oil slick track area. From 3 to 22 percent of great black-backed and herring gulls and black-legged kittiwakes, and 9 to 10 percent of northern fulmars (Fulmarus glacialis) observed were visibly oiled, outside and along

the periphery of the oil slick track area. In contrast, 20 to 48 percent of the gulls and 24 percent of the fulmars observed were visibly oiled within the oil slick track area.

Bird observations at sea from February through May 1977 on Nantucket Shoals and Georges Bank revealed less than five percent of the gulls and none of the fulmars observed were visibly oiled. Alcid sightings were infrequent and usually not close enough to properly examine plumages for visible oiling.

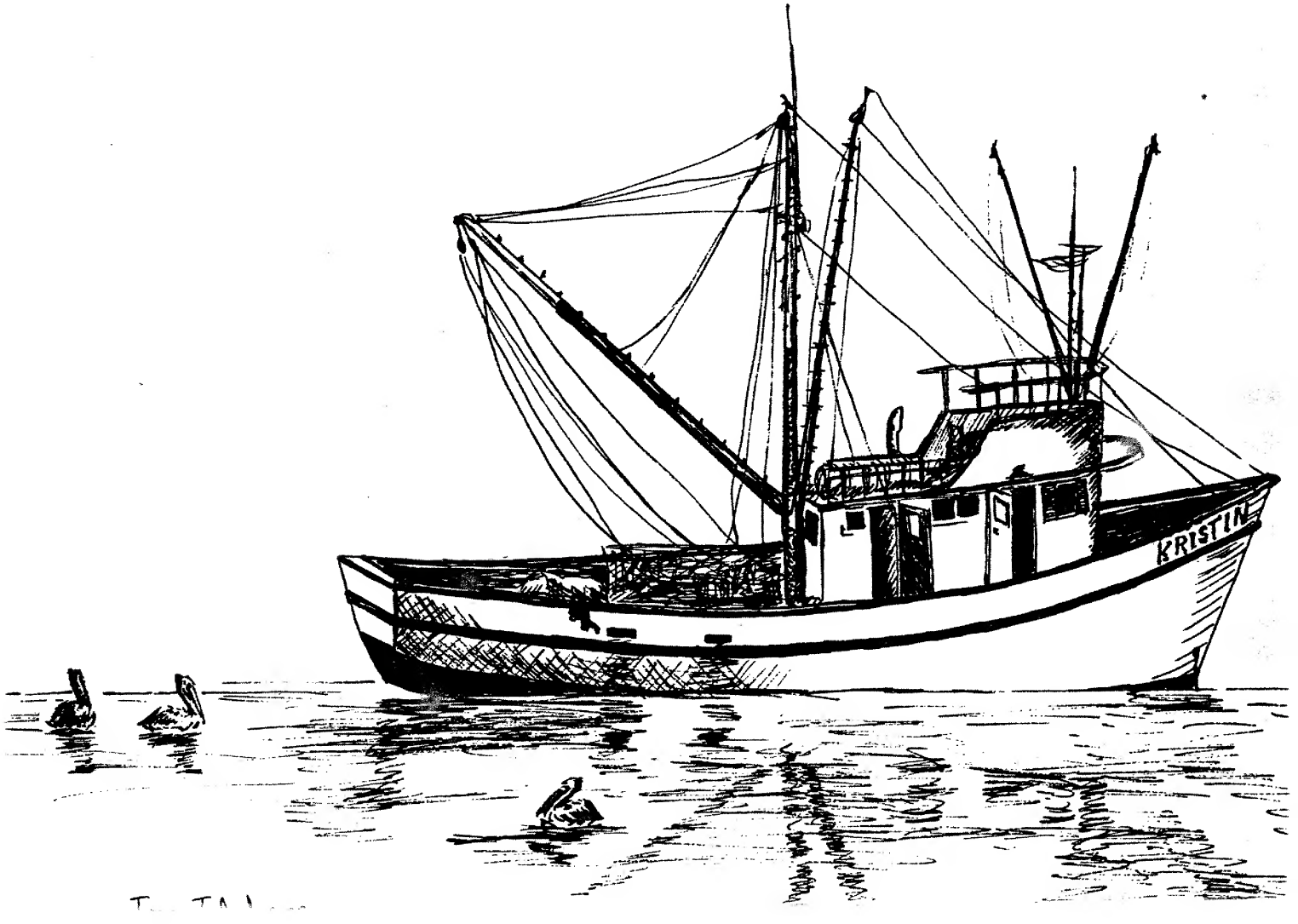


EDITOR'S NOTES: I am grateful to Sue Katz, PSG member and UCD student, for the ink drawings in this issue. Irene Anderson again typed this issue of the PSG Bulletin.

The PSG Bulletin solicits help (typing, artistry, etc.) for future bulletins. We can offer free PSG memberships to those who aid significantly in producing the PSG Bulletin.

The PSG Bulletin also accepts short articles or notes on marine or waterbird conservation. Please submit them to the Editor in the form of the articles of Volume 3, Number 2. Any items of interest are welcome.

Daniel W. Anderson
Editor
July 1977



DEDICATED TO THE STUDY AND CONSERVATION OF PACIFIC SEABIRDS AND THEIR ENVIRONMENT

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